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INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 0000054482	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/EP2003/011326	International filing date (day/month/year) 14 October 2003 (14.10.2003)	Priority date (day/month/year) 21 October 2002 (21.10.2002)
International Patent Classification (IPC) or national classification and IPC C14C 1/06		
Applicant BASF AKTIENGESELLSCHAFT		

<p>1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of <u>5</u> sheets, including this cover sheet.</p> <p><input type="checkbox"/> This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).</p> <p>These annexes consist of a total of <u> </u> sheets.</p>	
<p>3. This report contains indications relating to the following items:</p> <p>I <input checked="" type="checkbox"/> Basis of the report</p> <p>II <input type="checkbox"/> Priority</p> <p>III <input type="checkbox"/> Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p>IV <input type="checkbox"/> Lack of unity of invention</p> <p>V <input checked="" type="checkbox"/> Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p>VI <input type="checkbox"/> Certain documents cited</p> <p>VII <input type="checkbox"/> Certain defects in the international application</p> <p>VIII <input type="checkbox"/> Certain observations on the international application</p>	

Date of submission of the demand 14 January 2004 (14.01.2004)	Date of completion of this report 28 January 2005 (28.01.2005)
Name and mailing address of the IPEA/EP Facsimile No.	Authorized officer Telephone No.

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/EP2003/011326

I. Basis of the report

1. With regard to the elements of the international application:*

- ☐ the international application as originally filed
- ☒ the description:
 pages _____ 1-24 _____, as originally filed
 pages _____, filed with the demand
 pages _____, filed with the letter of _____
- ☒ the claims:
 pages _____ 1-13 _____, as originally filed
 pages _____, as amended (together with any statement under Article 19
 pages _____, filed with the demand
 pages _____, filed with the letter of _____
- ☐ the drawings:
 pages _____, as originally filed
 pages _____, filed with the demand
 pages _____, filed with the letter of _____
- ☐ the sequence listing part of the description:
 pages _____, as originally filed
 pages _____, filed with the demand
 pages _____, filed with the letter of _____

2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language _____ which is:

- ☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of the translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages _____
- ☐ the claims, Nos. _____
- ☐ the drawings, sheets/fig _____

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).**

* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rule 70.16 and 70.17).

** Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.
PCT/EP 03/11326

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	1-13	YES
	Claims		NO
Inventive step (IS)	Claims	1-13	YES
	Claims		NO
Industrial applicability (IA)	Claims	1-13	YES
	Claims		NO

2. Citations and explanations

Reference is made to the following document:

D1: WO 96 19590 A cited in the application

1. Novelty (PCT Article 33(2)) / Inventive step (PCT Article 33(3))

The subject matter of the current claims 1 to 13 is novel in comparison with the prior art as cited in the international search report. None of the international search report citations discloses a method for removing keratin from animal skins, involving the use in an aqueous liquor of a compound containing mercapto groups with at least one additional SH-, OH- or NHR- group (dimercaptothreitol) in a quantity of 0.05 to 5 wt.% relative to the weight of salt in the animal skin, and a catalyst for hydrolysing peptide bonds. Nor do said citations disclose the corresponding pelts, the melamine-containing residual liquors and the use thereof, or a method for regenerating the residual liquors.

The subject matter of the current claims 1 to 13 also involves an inventive step, since no indication of the claimed method can be found in D1, which is regarded as the closest prior art, taken either alone or in combination with any other document cited in the international search report, for the following reasons:

D1 discloses a method for dehairing animal skins using, in an aqueous liquor, an enzyme (protein disulphide isomerase, PDI) in combination with a redox partner, dithiothreitol (DTT), and a protease, there being no clear indication of the quantity of DTT used and there being no mention of regeneration of the residual liquors (D1: dehairing of neat's hide using PDI as enzyme; DTT is mentioned as redox partner, page 14, line 10 to page 15, line 7).

The difference between the dehairing method according to D1 and the present application is the amount of DTT used.

The technical problem of interest consists in developing a method for removing keratin from animal skins, the keratin being largely destroyed and the epidermis also being removed with very little malodour being released. The use of the aforementioned protease and DTT combination in a quantity of 0.05 to 5 wt.% in the aqueous liquor of the lime process leads to very light-coloured pelts from which the epidermis has been completely removed and the hairs and hair roots of which have been destroyed (see the examples as per the invention, E1 to E7, table 2 and page 20). The applicant has also shown that the residual liquor can be purified so as

to reduce the smell and can then be used as a soaking liquor (see page 23). The above solution was not obvious: document D1 discloses a combination of enzymes and DTT, but there is nothing in D1, taken either alone or in combination with any other document, that suggests to a person skilled in the art the use of a compound containing mercapto groups with at least one additional SH-, OH- or NHR- group in combination with a catalyst that cleaves peptide bonds, in the weight percentages indicated, resulting in the claimed method for removing keratin.

2. Industrial applicability (PCT Article 33(4))

The present application discloses a method for dehairing animal skins using an active substance combination that contains enzymes, and is therefore industrially applicable.